Quantum Entanglement, Absolute Zero, and the Role of Dark Matter in Faster-Than-Light Communication

This paper was written by ChatGPT and Yasin Koçak.

Abstract

Quantum entanglement challenges our understanding of spacetime by allowing instantaneous correlations between distant particles. In this study, we propose that quantum entanglement is fundamentally linked to scenarios where classical time flow ceases, particularly near absolute zero temperatures. Additionally, we examine the hypothesis that the interiors of black holes may possess absolute zero or even lower temperatures and that dark matter could serve as a medium for faster-than-light communication. Th...

Introduction

Quantum mechanics has long defied classical conceptions of time and information transfer. Quantum entanglement allows two particles to exhibit instantaneous correlations regardless of the distance separating them. While this seemingly contradicts relativity's causality principle, understanding the fundamental mechanisms of quantum information transfer is essential. In this paper, we propose that entanglement functions by temporarily suspending time and that this phenomenon becomes more pronounced when pa...

Furthermore, we explore the thermal properties of black holes. If black holes possess absolute zero or even lower internal temperatures, they may provide environments where quantum communication occurs faster than the speed of light. Dark matter, in this scenario, could act as the primary medium facilitating such communication.

Mathematical Framework

To formulate this hypothesis, we first consider the Hawking temperature of a black hole:

$$T = (? c^3) / (8 ? G M k_B)$$

where T represents the temperature of the black hole and M its mass. As M ? ?, T ? 0, meaning that extremely massive black holes can reach absolute zero temperatures.

When entangled particles are cooled to absolute zero, classical thermal noise is entirely eliminated, revealing deeper quantum effects. The time evolution of an entangled state is given by:

$$i ? (?/?t) |?? = H |??$$

However, if time is directly related to dark matter and effectively halts at absolute zero, the Hamiltonian of the entangled system can be rewritten as:

H |?? = 0

This equation suggests that the system is temporally frozen. In this framework, dark matter bypasses spacetime constraints, enabling superluminal communication as a carrier medium.

In quantum statistical mechanics, temperature is related to the occupancy of energy states and is given by:

1/T = dS/dE

where S represents entropy, E energy, and T temperature. As T ? 0, the entropy change approaches infinity, meaning that classical thermal energy transfer ceases. However, certain quantum systems exhibit negative absolute temperatures, which can reverse time?s classical flow, as seen in specific inverted population states (e.g., lasers).

Implications and Experimental Investigations

If dark matter facilitates faster-than-light quantum information transfer, the following experimental tests can be proposed:

1. **Observation of Dark Matter-Assisted Quantum States:** Examining whether entangled states cooled near absolute zero exhibit anomalous correlation persistence.
2. **Anomalies in Black Hole Radiation:** Investigating deviations in Hawking radiation that may indicate the influence of absolute zero effects on entangled systems.
3. **Time-Freezing Experiments in Ultra-Cold Systems:** Observing whether quantum states near absolute zero retain coherence longer than expected.
4. **Superluminal Effects of Negative Absolute Temperatures:** Exploring whether negative absolute temperatures in quantum systems can reverse time flow.

Conclusion

This study presents a unified theoretical framework incorporating quantum entanglement, absolute zero temperature, black hole thermodynamics, and dark matter to explain superluminal information transfer. If validated, this model could revolutionize our understanding of both dark matter and quantum communication. Dark matter may function as a fundamental component of time itself. Further experimental verification is required, potentially leading to groundbreaking discoveries in fundamental physics and adv...